

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/334740306>

# Complete chloroplast genome sequence of *Petrocodon jingxiensis* (Gesneriaceae)

Article in *Mitochondrial DNA Part B* · July 2019

DOI: 10.1080/23802359.2019.1624208

CITATION

1

READS

85

6 authors, including:



Zi-Bing Xin

Guangxi Institute of Botany, Chinese Academy of Sciences

22 PUBLICATIONS 18 CITATIONS

SEE PROFILE



Long-Fei Fu

Guangxi Institute of Botany, Guangxi Zhuang Autonomous Region and Chinese Ac...

47 PUBLICATIONS 98 CITATIONS

SEE PROFILE



Zhi-Xi Fu

Sichuan Normal University

16 PUBLICATIONS 25 CITATIONS

SEE PROFILE



Shu Li

Guangxi Academy of Sciences

13 PUBLICATIONS 8 CITATIONS

SEE PROFILE

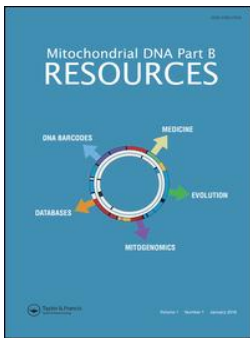
Some of the authors of this publication are also working on these related projects:



Systematics and Taxonomy of genus *Aster* and tribe *Astereae* (Asteraceae) [View project](#)



Phylogenetic [View project](#)



## Mitochondrial DNA Part B Resources

ISSN: (Print) 2380-2359 (Online) Journal homepage: <https://www.tandfonline.com/loi/tmdn20>

# Complete chloroplast genome sequence of *Petrocodon jingxiensis* (Gesneriaceae)

Zi-Bing Xin, Long-Fei Fu, Zhi-Xi Fu, Shu Li, Yi-Gang Wei & Fang Wen

To cite this article: Zi-Bing Xin, Long-Fei Fu, Zhi-Xi Fu, Shu Li, Yi-Gang Wei & Fang Wen (2019) Complete chloroplast genome sequence of *Petrocodon jingxiensis* (Gesneriaceae), Mitochondrial DNA Part B, 4:2, 2771-2772, DOI: [10.1080/23802359.2019.1624208](https://doi.org/10.1080/23802359.2019.1624208)

To link to this article: <https://doi.org/10.1080/23802359.2019.1624208>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 29 Jul 2019.



Submit your article to this journal [↗](#)



View Crossmark data [↗](#)

## Complete chloroplast genome sequence of *Petrocodon jingxiensis* (Gesneriaceae)

Zi-Bing Xin<sup>a,b</sup>, Long-Fei Fu<sup>a,b,c</sup>, Zhi-Xi Fu<sup>d</sup>, Shu Li<sup>a,b</sup>, Yi-Gang Wei<sup>a,b</sup> and Fang Wen<sup>a,b</sup>

<sup>a</sup>Guangxi Key Laboratory of Plant Conservation and Restoration Ecology in Karst Terrain, Guangxi Institute of Botany, Guangxi Zhuang Autonomous Region and, Chinese Academy of Sciences, Guilin, China; <sup>b</sup>Gesneriad Conservation Center of China, Guilin Botanical Garden, Chinese Academy of Sciences, Guilin, China; <sup>c</sup>Laboratory of Systematic Evolution and Biogeography of Woody Plants, College of Nature Conservation, Beijing Forestry University, Beijing, China; <sup>d</sup>College of Life Sciences, Sichuan Normal University, Chengdu, China

### ABSTRACT

The complete chloroplast genome of *Petrocodon jingxiensis* (Yan Liu, H.S. Gao, and W.B. Xu) A. Weber and Mich. Möller was determined in this study. The cp genome was 153,056 bp in length including two inverted repeats (IRs) of 25,405 bp, which were separated by LSC and SSC of 84,154 bp and 18,092 bp, respectively. The GC content was 41.9%. The genome encoded 112 functional genes, including 79 protein-coding genes, 29 tRNA genes, and four rRNA genes. This plastid genome is the first report for the *Petrocodon* in Gesneriaceae which will be useful data for developing markers for further studies on resolving the relationship within the genus.

### ARTICLE HISTORY

Received 7 May 2019  
Accepted 17 May 2019

### KEYWORDS

*Petrocodon*; plastid genome; phylogeny; Gesneriaceae

*Petrocodon* Hance (Gesneriaceae), is a small genus growing in mountainous karst habitats of S China, N Vietnam and NE Thailand (Hance 1883; Wang et al. 1998; Li and Wang 2004; Wei et al. 2010). Based on the latest molecular phylogenetic analyses, *Petrocodon* has been expanded to now include more than 30 species (Wang et al. 2011; Weber et al. 2011; Möller et al. 2016; IPNI 2019), and include all species previously referred to the genera *Calcareaoboea* C. Y. Wu ex H. W. Li, *Paralagarosolen* Y. G. Wei, *Dolicholoma* D. Fang and W. T. Wang, *Tengia* Chun, and *Lagarosolen* W. T. Wang, and four species from *Didymocarpus* Wall., one species from *Wentsaiboea* D. Fang and D. H. Qin and one species from *Primulina* Hance (Weber et al. 2011). Despite Möller et al. (2016) reconstructed the phylogenetic relationship of Gesneriaceae, the relationships within *Petrocodon* still remain poorly resolved.

The DNA sequence of the chloroplast genome can be used as a super barcode or a resource for research in phylogeography, genetic diversity and evolution. For *Petrocodon*, however, no complete chloroplast sequence has been published to date.

In the present study, mature and healthy leaves of *Petrocodon jingxiensis* were collected from natural population in Jingxi County, Baise City, Guangxi, China (N 106°21'24", E 23°1'32") and immediately dried by silica gel for DNA extraction. Voucher specimen (WF046) of this collection was deposited at IBK. The total genomic DNA was extracted using the CTAB method (Doyle and Doyle 1987) with minor modification and we sequenced the complete chloroplast genome of *Petrocodon jingxiensis* with Illumina HiSeq 4000 sequencing platform (Novogene, <http://www.novogene.com>, Beijing,

China). We used Map to Reference function in Geneious R11 (Kearse et al. 2012) to exclude nuclear and mitochondrial reads using published plastid genome of *Primulina huajieensis* (MF472012) as reference. The cp genome was manually adjusted to remove ambiguous sites. The annotation process was performed following Liu et al. (2018) using *Primulina huajieensis* (MF472012) as the reference. The complete chloroplast genome of *Petrocodon jingxiensis* was 153,056 bp in length (MK887172), the GC content was 41.9%. LSC and SSC contained 84,154 bp and 18,092 bp respectively, while IR was 25,405 bp in length. The plastid genome encoded 112 functional genes, including 79 protein-coding genes, 29 tRNA genes, and four rRNA genes.

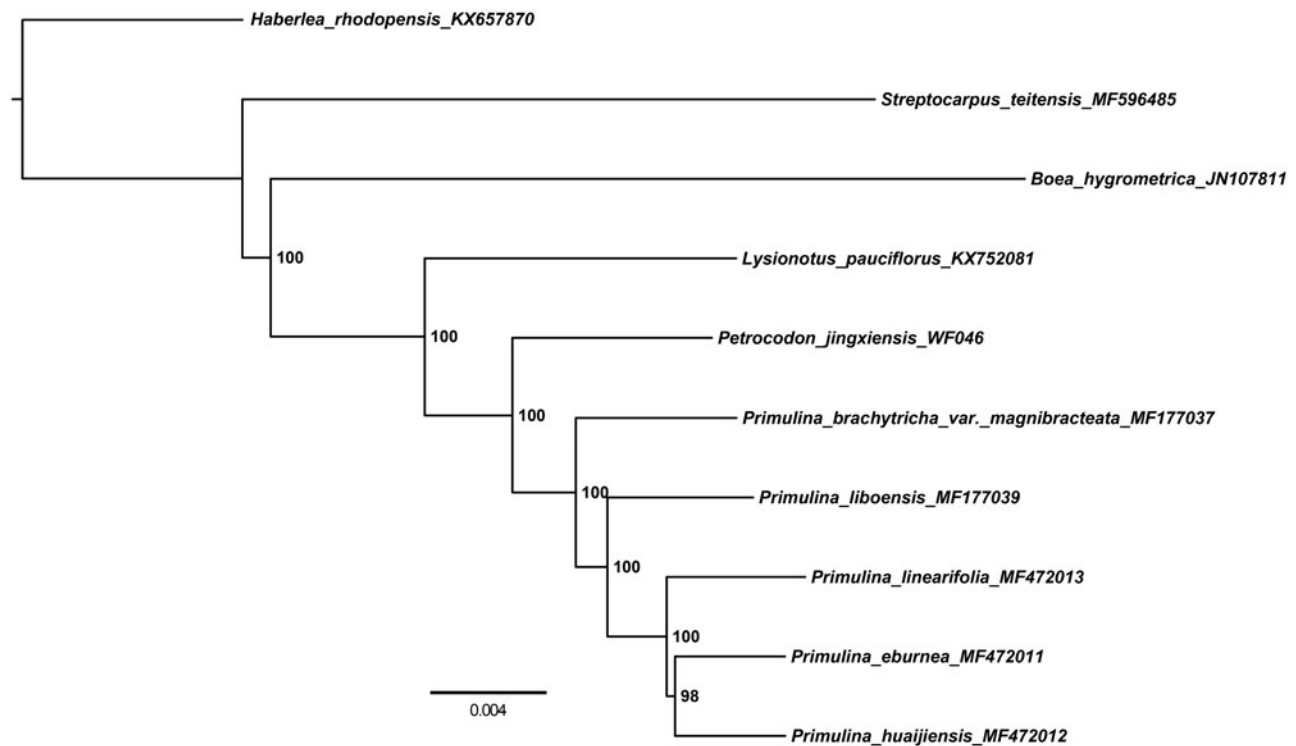
The maximum likelihood phylogenetic analysis of 10 chloroplast genomes showed that *Petrocodon jingxiensis* was most closely related to the members of *Primulina* (Figure 1). The newly characterized cp genome of *Petrocodon jingxiensis* will provide essential data for further study on the phylogeny and evolution of the genus *Petrocodon* and of the family Gesneriaceae.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### Funding

The study was supported by National Natural Science Foundation of China [31860047]; Natural Science Foundation of Guangxi Province [2017GXNSFAA198006]; Science and Technology Project of Guangxi Province [GuikeAB16380053]; Science Research Foundation of Guangxi



**Figure 1.** Phylogenetic tree reconstructed by maximum-likelihood (ML) analysis based on chloroplast genome sequences from 10 species of Gesneriaceae, numbers next to nodes are assessed by ML bootstrap.

Academy of Science [2017YJJ23022]; Foundation of Guangxi key Laboratory of Plant Conservation and Restoration Ecology in Karst Terrain [17-259-23].

## References

- Doyle JJ, Doyle JL. 1987. A rapid DNA isolation procedure for small quantities of fresh leaf material. *Phytochem Bull.* 19:11–15.
- Hance HF. 1883. New Chinese Cyrtandreae. *J. Bot.* 21:169.
- IPNI. 2019. The International Plant Names Index. <http://www.ipni.org> [accessed 2019 Apr 23].
- Kearse M, Moir R, Wilson A, Stones-Havas S, Cheung M, Sturrock S, Buxton S, Cooper A, Markowitz S, Duran C, et al. 2012. Geneious Basic: an integrated and extendable desktop software platform for the organization and analysis of sequence data. *Bioinformatics.* 28:1647–1649.
- Li ZY, Wang YZ. 2004. Plants of Gesneriaceae in China. Zhengzhou: Henan Science and Technology Publishing House; p. 170–260.
- Liu H, He J, Ding C, Lyu R, Pei L, Cheng J, Xie L. 2018. Comparative analysis of complete chloroplast genomes of *Anemoclema*, *Anemone*, *Pulsatilla*, and *Hepatica* revealing structural variations among genera in tribe Anemoneae (Ranunculaceae). *Front Plant Sci.* 9:1097.
- Möller M, Wei YG, Wen F, Clark JL, Weber A. 2016. You win some you lose some: updated generic delineations and classification of Gesneriaceae – implications for the family in China. *Guihaia.* 36:44–60.
- Wang YZ, Mao RB, Liu Y, Li JM, Dong Y, Li ZY, Smith JF. 2011. Phylogenetic reconstruction of *Chirita* and allies (Gesneriaceae) with taxonomic treatments. *J Syst Evol.* 49:50–64.
- Wang WT, Pan KY, L. ZY 1998. Gesneriaceae. In: Wu ZY and Raven PH, editors. *Flora of China* 18. Beijing: Science Press; China and Botanical Garden Press, St. Louis, Missouri; p. 244–401.
- Weber A, Wei YG, Puglisi C, Wen F, Mayer V, Möller M. 2011. A new definition of the genus *Petrocodon* (Gesneriaceae). *Phytotaxa.* 23:49–67.
- Wei YG, Wen F, Möller M, Monro A, Zhang Q, Gao Q, Mou HF, Zhong SH, Cui C. 2010. Gesneriaceae of South China. Zhengzhou: Henan Science and Technology Publishing House; p. 274–527.